Author index

Alagarswamy, G (*see* Henson, I.E.), 65
Alagarswamy, G. (*see* Henson, I.E.), 147
Appleyard, M. (*see* Kirby, E.J.M.), 477
Armond, P.A. (*see* Badger, M.R.), 85

Badger, M.R., Björkman, O. & Armond, P.A. An analysis of photosynthetic response and adaptation to temperature in higher plants: temperature acclimation in the desert evergreen *Nerium oleander* L., 85
Barclay, G.F. & Johnson, R.P.C. Analysis of particle motion in sieve tubes of *Heracleum*, 173
Beament, J.W.L. (*see* Corbet, S.A.), 125
Beardall, J. (*see* Raven, J.A.), 117
Beck, E., Senser, M., Scheibe, R., Steiger, H.-M. & Pongratz, P. Frost avoidance and freezing tolerance in afroalpine 'giant rosette' plants, 215
Beggs, C.J. (*see* Holmes, M.G.), 45
Belcher, A.R. (*see* Jefferies, C.J.), 231
Bengochea, T. (*see* Evans, D.E.), 101
Berry, J.A. (*see* Field, C.), 179
Berry, J.A. (*see* Harvey, G.W.), 241
Bhat, K.K.S. Nutrient inflows into apple roots. II. Nitrate uptake rates measured on intact roots of mature trees under field conditions, 461
Bidinger, F.R. (*see* Henson, I.E.), 65
Bidinger, F.R. (*see* Henson, I.E.), 147
Biswal, U.C. (*see* Misra, A.N.), 27
Björkman, O. (*see* Badger, M.R.), 85
Bogemans, J. (*see* François, G.), 5
Brain, P. (*see* Jefferies, C.J.), 231
Briens, M. & Larher, F. Osmoregulation in halophytic higher plants: a comparative study of soluble carbohydrates, polyols, betaines and free proline, 287
Briggs, W.R. (*see* Gorton, H.L.), 423
Briggs, W.R. (*see* Mandoli, D.F.), 137
Brunes, L. (*see* Öquist, G.), 9, 17

Cairns, A.J. (*see* Evans, D.E.), 101
Corbet, S.A., Beament, J.W.L. & Eisikowitch, D. Are electrostatic forces involved in pollen transfer? 125
Cunningham, W.P. (*see* Swanson, E.S.), 375

Davies, W.J., Rodriguez, J.L. & Fiscus, E.L. Stomatal behaviour and water movement through roots of wheat plants treated with abscisic acid, 485
Day, W. & Parkinson, K.J. Application to wheat and barley of two leaf photosynthesis models for C_3 plants, 501
Dixon, M. & Grace, J. Water uptake by some chamber materials, 323
Dodds, J.H. (*see* Evans, D.E.), 101
Duke, S.O., Vaughn, K.C. & Duke, S.H. Effects of norflurazon (San 9789) on light-increased extractable nitrate reductase activity in soybean (*Glycine max* (L.) Merr.) seedlings, 155
Duke, S.H. (*see* Duke S.O.), 155

Edwards, W.R.N. & Jarvis, P.G. Relations between water content, potential and permeability in stems of conifers, 271
Eisikowitch, D. (*see* Corbet, S.A.), 125
Evans, D.E., Bengochea, T., Cairns, A.J., Dodds, J.H. & Hall, M.A. Studies on ethylene binding by cell-free preparations from cotyledons of *Phaseolus vulgaris* L.: subcellular localization, 101

Fellowes, G. (*see* Kirby, E.J.M.), 477
Ferrier, J.M. (*see* Molz, F.J.), 191
Field, C., Berry, J.A. & Mooney, H.A. A portable system for measuring carbon dioxide and water vapour exchange of leaves, 179
Fiscus, E.L. (*see* Davies, W.J.), 485
Fitter, A.H. Morphometric analysis of root systems: application of the technique and influence of soil fertility on root system development in two herbaceous species, 313
Fitzsimons, P.J. (*see* Weyers, J.D.B.), 417
Fork, D.C. (*see* Harvey, G.W.), 241
François, G., Bogemans, J. & Neirinckx, L. Unidirectional sodium fluxes in red beet storage tissue (*Beta vulgaris* L. cv. Platronde Egyptische): effects of the phytohormones indol-3yl-acetic acid and abscisic acid, 5
Fuhrer, J. Early effects of excess cadmium uptake in *Phaseolus vulgaris*, 263

Gates, P.J. & Oparka, K.J. The use of the fluorescent probe 8-anilino-1-naphthalene sulphonic acid (ANS) as a histochemical stain in plant tissues, 251
Gibbs, J. (*see* Greenway, H.), 405
Gibson, A.C. (*see* Mott, K.A.), 455
Glass, A.D.M. & Siddiqi, M.Y. Cation-stimulated H^+ efflux by intact roots of barley, 385
Goodenough, A. (*see* Jackson, M.B.), 163
Gordon, D.C., MacDonald, I.R. & Hart, J.W. Regional growth patterns in the hypocotyls of etiolated and green cress seedlings in light and darkness, 347
Gordon, D.C. (*see* Hart, J.W.), 361
Gordon, D.C. (*see* MacDonald, I.R.), 355
Gorton, H.L. & Briggs, W.R. A survey of the reciprocity characteristics of responses to end-of-day irradiations in oat, sunflower, and mung bean, 423
Grace, J. (*see* Dixon, M.), 323
Granat, L. (*see* Hällgren, J.-E.), 75
Greenway, H., Munns, R. & Gibbs, J. Effects of accumulation of 3-*O*-methylglucose an levels of endogenous osmotic solutes in *Chlorella emersonii*, 405
Greenway, H. (*see* Munns, R.), 413
Gröschel-Stewart, U. (*see* Müller, D.), 223
Gusta, L. V. (*see* Harvey, G.W.), 241

Hall, M.A. (*see* Evans, D.E.), 101
Hällgren, J.-E., Linder, S., Richter, A., Troeng, E. & Granat, L. Uptake of SO_2 in shoots of Scots pine: field measurements of net flux of sulphur in relation to stomatal conductance, 75
Hällgren, J.-E. (*see* Öquist, G.), 9, 17
Hart, J.W., Gordon, D.C. & MacDonald, I.R. Analysis of growth during phototropic curvature of cress hypocotyls, 361
Hart, J.W. (*see* Gordon, D.C.), 347
Hart, J.W. (*see* MacDonald, I.R.), 355
Harvey, G.W., Gusta, L.V., Fork, D.C. & Berry, J.A. The relation between membrane lipid phase separation and frost tolerance of cereals and other cool climate plant species, 241
Heath, R. (*see* Swanson, E.S.), 375
Heathcote, D. Nutation in georeacting roots, 343
Helder, R.J. (*see* Prins, H.B.A.), 207
Henson, I.E., Alagarswamy, G., Bidinger, F.R. & Mahalakshmi, V. Stomatal responses of pearl millet (*Pennisetum americanum* (L.) Leeke) to leaf water status and environmental factors in the field, 65
Henson, I.E., Mahalakshmi, V., Bidinger, F.R. & Alagarswamy, G. Osmotic adjustment to water stress in pearl millet (*Pennisetum americanum* (L.) Leeke) under field conditons, 147
Herman, B. (*see* Jackson, M.B.), 163
Holmes, M.G., Beggs, C.J., Jabben, M. & Schäfer, E. Hypocotyl growth in *Sinapis alba* L.: the roles of light quality and quantity, 45

Ingestad, T. Relative addition rate and external concentration; Driving variables used in plant nutrition research, 443

Jabben, M. (*see* Holmes, M.G.), 45

Author index

Alagarswamy, G (*see* Henson, I.E.), 65
Alagarswamy, G. (*see* Henson, I.E.), 147
Appleyard, M. (*see* Kirby, E.J.M.), 477
Armond, P.A. (*see* Badger, M.R.), 85

Badger, M.R., Björkman, O. & Armond, P.A. An analysis of photosynthetic response and adaptation to temperature in higher plants: temperature acclimation in the desert evergreen *Nerium oleander* L., 85
Barclay, G.F. & Johnson, R.P.C. Analysis of particle motion in sieve tubes of *Heracleum*, 173
Beament, J.W.L. (*see* Corbet, S.A.), 125
Beardall, J. (*see* Raven, J.A.), 117
Beck, E., Senser, M., Scheibe, R., Steiger, H.-M. & Pongratz, P. Frost avoidance and freezing tolerance in afroalpine 'giant rosette' plants, 215
Beggs, C.J. (*see* Holmes, M.G.), 45
Belcher, A.R. (*see* Jefferies, C.J.), 231
Bengochea, T. (*see* Evans, D.E.), 101
Berry, J.A. (*see* Field, C.), 179
Berry, J.A. (*see* Harvey, G.W.), 241
Bhat, K.K.S. Nutrient inflows into apple roots. II. Nitrate uptake rates measured on intact roots of mature trees under field conditions, 461
Bidinger, F.R. (*see* Henson, I.E.), 65
Bidinger, F.R. (*see* Henson, I.E.), 147
Biswal, U.C. (*see* Misra, A.N.), 27
Björkman, O. (*see* Badger, M.R.), 85
Bogemans, J. (*see* François, G.), 5
Brain, P. (*see* Jefferies, C.J.), 231
Briens, M. & Larher, F. Osmoregulation in halophytic higher plants: a comparative study of soluble carbohydrates, polyols, betaines and free proline, 287
Briggs, W.R. (*see* Gorton, H.L.), 423
Briggs, W.R. (*see* Mandoli, D.F.), 137
Brunes, L. (*see* Öquist, G.), 9, 17

Cairns, A.J. (*see* Evans, D.E.), 101
Corbet, S.A., Beament, J.W.L. & Eisikowitch, D. Are electrostatic forces involved in pollen transfer? 125
Cunningham, W.P. (*see* Swanson, E.S.), 375

Davies, W.J., Rodriguez, J.L. & Fiscus, E.L. Stomatal behaviour and water movement through roots of wheat plants treated with abscisic acid, 485
Day, W. & Parkinson, K.J. Application to wheat and barley of two leaf photosynthesis models for C_3 plants, 501
Dixon, M. & Grace, J. Water uptake by some chamber materials, 323
Dodds, J.H. (*see* Evans, D.E.), 101
Duke, S.O., Vaughn, K.C. & Duke, S.H. Effects of norflurazon (San 9789) on light-increased extractable nitrate reductase activity in soybean (*Glycine max* (L.) Merr.) seedlings, 155
Duke, S.H. (*see* Duke S.O.), 155

Edwards, W.R.N. & Jarvis, P.G. Relations between water content, potential and permeability in stems of conifers, 271
Eisikowitch, D. (*see* Corbet, S.A.), 125
Evans, D.E., Bengochea, T., Cairns, A.J., Dodds, J.H. & Hall, M.A. Studies on ethylene binding by cell-free preparations from cotyledons of *Phaseolus vulgaris* L.: subcellular localization, 101

Fellowes, G. (*see* Kirby, E.J.M.), 477
Ferrier, J.M. (*see* Molz, F.J.), 191
Field, C., Berry, J.A. & Mooney, H.A. A portable system for measuring carbon dioxide and water vapour exchange of leaves, 179
Fiscus, E.L. (*see* Davies, W.J.), 485
Fitter, A.H. Morphometric analysis of root systems: application of the technique and influence of soil fertility on root system development in two herbaceous species, 313
Fitzsimons, P.J. (*see* Weyers, J.D.B.), 417
Fork, D.C. (*see* Harvey, G.W.), 241
François, G., Bogemans, J. & Neirinckx, L. Unidirectional sodium fluxes in red beet storage tissue (*Beta vulgaris* L. cv. Platronde Egyptische): effects of the phytohormones indol-3yl-acetic acid and abscisic acid, 5
Fuhrer, J. Early effects of excess cadmium uptake in *Phaseolus vulgaris*, 263

Gates, P.J. & Oparka, K.J. The use of the fluorescent probe 8-anilino-1-naphthalene sulphonic acid (ANS) as a histochemical stain in plant tissues, 251
Gibbs, J. (*see* Greenway, H.), 405
Gibson, A.C. (*see* Mott, K.A.), 455
Glass, A.D.M. & Siddiqi, M.Y. Cation-stimulated H^+ efflux by intact roots of barley, 385
Goodenough, A. (*see* Jackson, M.B.), 163
Gordon, D.C., MacDonald, I.R. & Hart, J.W. Regional growth patterns in the hypocotyls of etiolated and green cress seedlings in light and darkness, 347
Gordon, D.C. (*see* Hart, J.W.), 361
Gordon, D.C. (*see* MacDonald, I.R.), 355
Gorton, H.L. & Briggs, W.R. A survey of the reciprocity characteristics of responses to end-of-day irradiations in oat, sunflower, and mung bean, 423
Grace, J. (*see* Dixon, M.), 323
Granat, L. (*see* Hällgren, J.-E.), 75
Greenway, H., Munns, R. & Gibbs, J. Effects of accumulation of 3-*O*-methylglucose an levels of endogenous osmotic solutes in *Chlorella emersonii*, 405
Greenway, H. (*see* Munns, R.), 413
Gröschel-Stewart, U. (*see* Müller, D.), 223
Gusta, L. V. (*see* Harvey, G.W.), 241

Hall, M.A. (*see* Evans, D.E.), 101
Hällgren, J.-E., Linder, S., Richter, A., Troeng, E. & Granat, L. Uptake of SO_2 in shoots of Scots pine: field measurements of net flux of sulphur in relation to stomatal conductance, 75
Hällgren, J.-E. (*see* Öquist, G.), 9, 17
Hart, J.W., Gordon, D.C. & MacDonald, I.R. Analysis of growth during phototropic curvature of cress hypocotyls, 361
Hart, J.W. (*see* Gordon, D.C.), 347
Hart, J.W. (*see* MacDonald, I.R.), 355
Harvey, G.W., Gusta, L.V., Fork, D.C. & Berry, J.A. The relation between membrane lipid phase separation and frost tolerance of cereals and other cool climate plant species, 241
Heath, R. (*see* Swanson, E.S.), 375
Heathcote, D. Nutation in georeacting roots, 343
Helder, R.J. (*see* Prins, H.B.A.), 207
Henson, I.E., Alagarswamy, G., Bidinger, F.R. & Mahalakshmi, V. Stomatal responses of pearl millet (*Pennisetum americanum* (L.) Leeke) to leaf water status and environmental factors in the field, 65
Henson, I.E., Mahalakshmi, V., Bidinger, F.R. & Alagarswamy, G. Osmotic adjustment to water stress in pearl millet (*Pennisetum americanum* (L.) Leeke) under field conditons, 147
Herman, B. (*see* Jackson, M.B.), 163
Holmes, M.G., Beggs, C.J., Jabben, M. & Schäfer, E. Hypocotyl growth in *Sinapis alba* L.: the roles of light quality and quantity, 45

Ingestad, T. Relative addition rate and external concentration; Driving variables used in plant nutrition research, 443

Jabben, M. (*see* Holmes, M.G.), 45

Jackson, M.B., Herman, B. & Goodenough, A. An examination of the importance of ethanol in causing injury to flooded plants, 163
Jacques, R. (*see* Lecharny, A.), 31
Jarvis, P.G. (*see* Edwards, W.R.N.), 271
Jefferies, C.J., Brain, P., Stott, K.G. & Belcher, A.R. Experimental systems and a mathematical model for studying temperature effects on pollen-tube growth and fertilization in plum, 231
Johnson, R.P.C. (*see* Barclay, G.F.), 173
Johnson, R.P.C. (*see* Oparka, K.J.), 237

King, R.W., Schäfer, E., Thomas, B. & Vince-Prue, D. Photoperiodism and rhythmic response to light, 395
Kirby, E.J.M., Appleyard, M. & Fellowes, G. Effect of sowing date on the temperature response of leaf emergence and leaf size in barley, 477
Kluge, M. (*see* Müller, D.), 223

Lamb, C.J. Effects of competitive inhibitors of phenylalanine ammonia-lyase on the levels of phenylpropanoid enzymes in *Solanum tuberosum*, 471
Larher, F. (*see* Briens, M.), 287
Lecharny, A. & Jacques, R. Photo-inhibition of internode elongation rate in light-grown *Vigna sinensis* L. Control by light quality, 31
Linder, S. (*see* Hällgren, J.-E.), 75

MacDonald, I.R., Hart, J.W. & Gordon, D.C. Analysis of growth during light-induced hook opening in cress, 355
MacDonald, I.R. (*see* Gordon, D.C.), 347
MacDonald, I.R. (*see* Hart, J.W.), 361
Mahalakshmi, V. (*see* Henson, I.E.), 65
Mahalakshmi, V. (*see* Henson, I.E.), 147
Mandoli, D.F. & Briggs, W.R. The photoperceptive sites and the function of tissue light-piping in photomorphogenesis of etiolated oat seedlings, 137
Mansfield, T.A. (*see* Smith, P.J.), 309
Melanson, D. & Trewavas, A.J. Changes in tissue protein pattern in relation to auxin induction of DNA synthesis, 53
Misra, A.N. & Biswal, U.C. Differential changes in the electron transport properties of thylakoid membranes during aging of attached and detached leaves, and of isolated chloroplasts, 27
Mizuno, A. & Okamoto, H. Structure and function of the elongation sink in the stems of higher plants. II. Effects of acids and anoxia on the growth rate and the spatially separate electrogenic ion pumps, 131
Mohr, H. (*see* Schmidt, R.), 495
Molz, F.J. & Ferrier, J.M. Mathematical treatment of water movement in plant cells and tissue, 191
Mooney, H.A. (*see* Field, C.), 179
Mott, K.A., Gibson, A.C. & O'Leary, J.W. The adaptive significance of amphistomatic leaves, 455
Müller, D., Kluge, M. & Gröschel-Stewart, U. Comparative studies on immunological and molecular properties of phosphoenolpyruvate carboxylase in species of *Sedum* and *Kalanchoë* performing crassulacean acid metabolism (CAM), 223
Munns, R., Greenway, H. & Prior, L. Effects of accumulation of 3-*O*-methylglucose on growth and osmotic regulation in *Chlorella emersonii*, 413
Munns, R. (*see* Greenway, H.), 405

Neirinckx, L. (*see* François, G.), 5

Okamoto, H. (*see* Mizuno, A.), 131
O'Leary, J.W. (*see* Mott, K.A.), 455
Oparka, K.J. & Johnson, R.P.C. Acid phosphatase activity in intercellular spaces in roots of *Nymphoides peltata* (S.G. Gmel.) O. Kuntze, 237
Oparka, K.J. (*see* Gates, P.J.), 251
Öquist, G. Brunes, L. & Hällgren, J.-E. Photosynthetic efficiency of *Betula pendula* acclimated to different quantum flux densities, 9
Öquist, G., Brunes, L. & Hällgren, J.-E. Photosynthetic efficiency during ontogenesis of leaves of *Betula pendula*, 17

Parker, M. Protein accumulation in developing endosperm of a high-protein line of *Triticum dicoccoides*, 37
Parkinson, K.J. (*see* Day, W.), 501
Pecket, R.C. (*see* Small, C.J.), 1
Pecket, R.C. (*see* Small, C.J.), 245
Pickard, B.G. (*see* Ulbright, C.E.), 293, 303
Platt-Aloia, K. (*see* Thomson, W.W.), 367
Pongratz, P. (*see* Beck, E.), 215
Prins, H.B.A., Snel, J.F.H., Zanstra, P.E. & Helder, R.J. The mechanism of bicarbonate assimilation by the polar leaves of *Potamogeton* and *Elodea*. CO_2 concentrations at the leaf surface, 207
Prior, L. (*see* Munns, R.), 413

Quarrie, S.A. Droopy: a wilty mutant of potato deficient in abscisic acid, 23

Raven, J.A. & Beardall, J. The lower limit of photon fluence rate for phototrophic growth: the significance of 'slippage' reactions, 117
Rawson, H.M. (*see* Takami, S.), 279
Richter, A. (*see* Hällgren, J.-E.), 75
Rodriguez, J.L. (*see* Davies, W.J.), 485

Schäfer, E. (*see* Holmes, M.G.), 45
Schäfer, E. (*see* King, R.W.), 395
Scheibe, R. (*see* Beck, E.), 215
Schmidt, R. & Mohr, H. Evidence that a mustard seedling responds to the amount of P_{fr} and not to the P_{fr}/P_{tot} ratio, 495
Scott, I.M. Information theory and plant growth substance, 339
Senser, M. (*see* Beck, E.), 215
Siddiqi, M.Y. (*see* Glass, A.D.M.), 385
Small, C.J. & Pecket, R.C. Change in sensitivity to far-red irradiation on anthocyanin biosynthesis in red cabbage seedlings, 1
Small, C.J. & Pecket, R.C. Effect of temperature on phytochrome-mediated anthocyanin synthesis in red cabbage, 245
Smith, P.J. & Mansfield, T.A. Stomatal sensitivity to abscisic acid: can it be defined? 309
Snel, J.F.H. (*see* Prins, H.B.A.), 207
Steiger, H.-M. (*see* Beck, E.), 215
Stott, K.G. (*see* Jefferies, C.J.), 231
Swanson, E.S., Toivio-Kinnucan, M., Heath, R. & Cunningham, W.P. Ozone-induced ultra-structural changes in the plasma membrane of *Chlorella sorokiniana*, 375

Takami, S., Rawson, H.M. & Turner, N.C. Leaf expansion of four sunflower (*Helianthus annus* L.) cultivars in relation to water deficits. II. Diurnal patterns during stress and recovery, 279
Thomas, B. (*see* King, R.W.), 395
Thomson, W.W. & Platt-Aloia, K. Ultra-structure and membrane permeability in cowpea seeds, 367
Toivio-Kinnucan, M. (*see* Swanson, E.S.), 375
Trewavas, A.J. (*see* Melanson, D.), 53
Troeng, E. (*see* Hällgren, J.-E.), 75
Turner, N.C. (*see* Takami, S.), 279

Ulbright, C.E., Pickard, B.G. & Varner, J.E. Effects of short chain fatty acids on radicle emergence and root growth in lettuce, 293
Ulbright, C.E., Pickard, B.G. & Varner, J.E. Effects of short chain fatty acids on seedlings, 303
Varner, J.E. (*see* Ulbright, C.E.), 293, 303
Vaughn, K.C. (*see* Duke, S.O.), 155
Vince-Prue D. (*see* King, R.W.), 395

Weyers, J.D.B. & Fitzsimons, P.J. The non-osmotic volume of *Commelina* guard cells, 417

Zanstra, P.E. (*see* Prins, H.B.A.), 207

Book reviews
Books received
Barber, J. (ed.) Electron Transport and Photophosphorylation, Topics in Photosynthesis, Vol. 4, 431
Bewley, J.D. (ed.) Developments in Plant and Soil Sciences. Volume 3. Carbon and Nitrogen Metabolism, 331
Brouwer, R., Gašparíková, O., Kolek, J. & Loughman, B.C. (ed.) Structure and Function of Plant Roots, 336
Causton, D.R. & Venus, J.C. The Biometry of Plant Growth, 260
Charles-Edwards, D.A. The Mathematics of Photosynthesis and Productivity, 432
Chatt, J., Da Camara Pina, L.M. & Richards, R.L. (ed.) New Trends in the Chemistry of Nitrogen Fixation, 114
Conger, B.V. (ed.) Cloning Agricultural Plants via *in vitro* Techniques, 329
Fitter, A.H. & Hay, R.K.M. Environmental Physiology of Plants, 115
Grace, J., Ford, E.D. & Jarvis, P.G. (ed.) Plants and their Atmospheric Environment, 110
Hall, D.O. & Rao, K.K. Studies in Biology, No. 37. Photosynthesis, 257
Janick, J., Schery, R.W., Woods, F.W. & Ruttan, V. Plant Science: An Introduction to World Crops, 190
Jarvis, P.G. & Mansfield, T.A. (ed.) Stomatal Physiology, 331
Jeffcoat, B. (ed.) Aspects and Prospects of Plant Growth Regulators, 109
John, P.C.L. (ed.) The Cell Cycle, 337
Johnson, C.B. (ed.) Physiological Processes Limiting Plant Productivity, 333
Kurstak, E. (ed.) Handbook of Plant Virus Infections: Comparative Diagnosis, 188
Lepp, N.W. (ed.) Effects of Heavy Metal Pollution on Plants. Volume 1. Effects of Trace metals on Plant Function. Volume 2. Metals in the Environment, 330
Marmé, D., Marrè, E. & Hertel, R. (ed.) Plasmalemma and Tonoplast: Their Functions in the Plant Cell, 434
Murray, R.D.H., Mendez, J. & Brown, S.A. The Natural Coumarins: Occurrence, Chemistry and Biochemistry, 435
Newman, E.I. (ed.) The Plant Community as a Working Mechanism, 434
O'Brien, T.P. & McCully, M.E. The study of Plant Structure: Principles and Selected Methods, 258
Old, R.W. & Primrose, S.B. Principles of Genetic Manipulation: An Introduction to Genetic Engineering, 187
Osmond, C.B., Björkman, O. & Anderson, D.J. Ecological studies. Volume 36. Physiological Processes in Plant Ecology. Toward a Synthesis with *Atriplex*, 332
Papavizas, G.C. (ed.) Biological Control in Crop Production, 436
Pitman Advanced Publishing Programme. Plant Tissue Culture, 110
Porter, J.W. & Spurgeon, S.L. (ed.) Biosynthesis of Isoprenoid Compounds, Volume 1, 335
Richardson, D.H.S. The Biology of Mosses, 187
Rose, D.A. & Charles-Edwards, D.A. (ed.) Mathematics and Plant Physiology, 334
Schulz-Schaeffer, J. Cytogenetics, 189
Senger, H. (ed.) The Blue Light Syndrome, 112
Smith, H. (ed.) Commentaries in Plant Science, 114
Stewart, W.D.P. & Gallon, J.R. (ed.) Nitrogen Fixation, 112
Sutcliffe, J.F. & Baker, D.A. Studies in Biology, No. 48. Plants and Mineral Salts, 257
Turner, N.C. & Kramer, P.J. Adaptation of Plants to Water and High Temperature Stress, 259
Woolhouse, H. (ed.) Advances in Botanical Research, Volume 8, 109
Yeoman, M.M. & Truman, D.E.S. (ed.) Differentiation *in vitro*, 433

Reviewers
Billett, M.A., 187
Black, M., 112
Broadbent, L., 436
Clarkson, D.T., 257, 336
Cockburn, W., 257
Duckett, J.G., 187
Farrar, J.F., 260
Harborne, J.B., 435
Horgan, R., 109
Hussey, G., 329
Jennings, D.H., 109, 114, 331, 434
King, P.J., 433
Landsberg, J.J., 432
Mackenzie, I.A., 110
Macmillan, J., 335
Mansfield, T.A., 110
Moorby, J., 334
Raven, J.A., 332
Rees, H., 189
Roberts, T.M., 330
Schulze, E.-D., 259, 331
Steer, M.W., 258
Stewart, G., 112
Stewart, W.D.P., 114
Thresh, J.M., 188
Turnock, G., 337
Wareing, P.F., 333
Wood, P.M., 431
Woodward, F.I., 115
Wright, D., 190
Wyn Jones, R.G., 434

Subject index

Abscisic acid, 5, 23, 309, 485
Absorption, 323
Acclimation, 9
Acclimation, temperature, 85
Acid growth, 131
Acid phosphatase, 237
Acids, fatty, 293, 303
Activation energy, 461
Adaptation, 85
Adaptation, shade, 117
Adsorption, 323
Aeration, 163
Afroalpine vegetation, 215
Ageing, 27
α-aminooxy-β-phenylpropionic acid, 471
Amphistomatic, 455
Analysis, compartmental, 5
Analysis, morphometric, 313
Angiosperms, aquatic, 207
Anoxia, 131
ANS, 8-anilino-1-naphthalene sulphonic acid, 251
Anthocyanin, 1, 245
Anthocyanin synthesis, 495
Apis mellifera, 125
Apocynaceae, 85
Apple, 461
Aquatic angiosperms, 207
Artichoke, 53
Assimilation, nitrogen, 155
Asteraceae, 215
ATPase, CF_0-CF_1, 117
Auxin, 53
Avena sativa, 137, 423
Azo-dye, 237

Barley, 477, 501
Barley roots, 385
Base temperature, 477
Bean, French, 101
Beet, red, 5
Beta vulgaris L., 5
Betulaceae, 9, 17
Betula pendula, 9, 17
Bicarbonate, 207
Birch, 9, 17
Brassicaceae, 495
Brassica napus, 125
Brassica oleracea, 1, 245
Brassica rapa, L., 293, 303
Brownian motion, 173

C_3 plants, 501
Cabbage, red, 1, 245
Cadmium, 263
Carbohydrates, soluble, 287
Carbon dioxide, 207
Cation uptake, 385
Cell motility, 173
Cells, 191
Cell walls, 263, 485
CF_0-CF_1 ATPase, 117
Chain, short, 293, 303
Chenopodiaceae, 5
Chlorella emersonii, 405, 413
Chlorella sorokiniana, 375
Chlorogenic acid, 471
Chlorophyll fluorescence, 241
Chloroplast, 27
Chromatography, 339
Circadian rhythms, 395
Cinnamic acid 4-hydroxylase, 471
Commelina communis, 309, 417
Commelinaceae, 417
Compartmental analysis, 5
Compositae, 279, 293, 303, 423
Concentration, internal, 443
Conductance, 455
Conductance, stomatal, 23, 65, 75
Convolvulaceae, 395
Cowpea, 31, 131, 367
Crassulacean acid metabolism (CAM), 223
Cress, 347, 355, 361
Cruciferae, 1, 125, 245, 293, 303, 347, 355, 361

Day-degree, 231
Day-flower, 417
Daylength, rate of change, 477
Development, seedling, 339, 347, 353
Diurnal rhythms, 461
DNA synthesis, 53
Dormancy, 293, 303
Droopy potato, 23
Dry deposition, 75

Elasticity, modulus of, 485
Electrogenic ion pumps, 131
Electron transport, 27
Electron transport, photosynthetic, 9, 17
Electrostatics, 125
Elodea canadensis, 207
Elongation growth, 45
Elongation rate, internode, 31
Endosperm, 37
Enzyme regulation, 471
Enzymes, 85
Enzymes, marker, 101
Ethanol, 163
Ethylene, 101
Ethylene formation, 263

Fabaceae, 101
Far-red sensitivity, 1
Fatty acids, 293, 303
Fertilizer, 443
Fertilization, 231
Flooding, 163
Fluorescence, chlorophyll, 241
Fluorescence microscopy, 251
Fluorescent probes, 241
Flowering, 395
Flux density, quantum, 9
Fluxes, sodium, 5
Freeze-fracture, 367
Freezing tolerance, 215
French bean, 101
Frost tolerance, 241

Gas exchange system, 179
Giant Lobelias, 215
Georeaction, 343
Glycine max, 155
Golgi apparatus, 37
Graminaceae, 501
Gramineae, 27, 37, 65, 137, 147, 343, 423
Gravity effects, 343
Groundsel, 215
Growth, 355, 413
Growth, acid, 131

Growth analysis, 361
Growth, elongation, 45
Growth-model, 231
Growth rate, relative, 443
Guard cells, 417

H^+ efflux, 385
H^+ permeability, 117
Halophytes, 287
Helianthus annuus, 279, 423
Helianthus tuberosus, 53
Heracleum mantegazzianum, 173
Heracleum sphondylium, 173
Hill reaction, 27
Histochemical stain, 251
Honeybee, 125
Hook opening, 355
Hordeum distichum, 501
Hormone binding, 101
Hormones, 5
Horton's Laws, 313
Humidity response, 179
Hydraulic conductance, 485
Hydroxy-cinnamoyl-CoA, 471
Hypocotyl, 45
Hypocotyl growth, 347

Indol-3yl-acetic acid, 5, 309
Induction, 461
Information theory, 339
Intercellular space, 237
Internode elongation rate, 31
Ion pumps, electrogenic, 131
Irradiation, end-of-day, 423

Japanese morning glory, 395

Kalanchoë, 223

Lactuca sativa, 293, 303
Lamiceae, 179
Lead salt, 237
Leaf emergence, 477
Leaf expansion, 279
Leaf growth, 279
Leaf size, 477
Leguminosae, 31, 131, 155, 367, 423
Lepechinia calcynia, 179
Lepidium sativum, 347, 355, 361
Lettuce, 293, 303
Light, 355
Light-grown plants, 31
Light-piping, 137
Light quality, 31, 45
Light quantity, 45
Light response, 347
Lipids, membrane, 241
Liposomes, 241
Lobelia keniensis, 215
Lobelia telekii, 215
Logistic, 231
Low temperature avoidance, 215

Maize, 343
Malus domestica, 461
Marker enzymes, 101
Membrane lipids, 241
Membrane permeability, 375
Membranes, 367
3-*O*-methylglucose accumulation, 405, 413
Methylviologen reduction, 27
Microscopy, fluorescence, 251
Millet, pearl, 65
Models, 191, 501
Morphogenesis, roots, 313
Mung bean, 423
Mustard, 495

Nerium oleander L., 85
Nitrate reductase, 155
Nitrate uptake rate, 461
Nitrogen assimilation, 155
Non-osmotic volume, 417
Nuclear proteins, 53
Nutation, 343
Nutrient deficiency, 443
Nutrient flux density, 443
Nutrient requirements, 443
Nutrient status, 443
Nutrition/growth relationships, 443
Nymphoides peltata, 237

Oats, 137, 423
Oilseed rape, 125
Oleander, 85
Ontogenesis, 17
Osmoregulation, 287
Osmotic adjustment, 147, 279
Osmotic pressure, 413
Osmotic regulation, 405, 413
Ozone, 375

Pearl millet, 65, 147
Pennisetum americanum (L.) Leeke, 65, 147
PEP-carboxylase, 223
PEP-c, immunological properties of, 223
PEP-c, substructure of, 223
Permeability, 271
Permeability, H^+, 117
Peroxidase, 263
pH, surface, 207
Pharbitis nil, 395
Phaseolus vulgaris L., 101, 263
Phase separation, 241
Phenolics, 263
Phenylalanine ammonia-lyase, 471
Phenylpropanoid enzymes, 471
Phosphatase, acid, 237
Phospholipids, 241
Phosphorylation, 53
Photography, time-lapse, 347, 355, 361
Photomorphogenesis, 137, 155
Photoperceptive sites, 137
Photoperiodism, 395
Photosynthesis, 9, 17, 85, 179, 207, 455, 501
Photosynthetic electron transport, 9, 17
Photosynthetic unit, 117
Phototropism, 361
Phytochrome, 1, 31, 45, 155, 245, 423, 395
Phytochrome action, 495
Picea sitchensis, 271
Pinaceae, 75
Pine, Scots, 75
Pinus contorta, 271
Pinus silvestris L., 75
Pisum sativum, L., 163
Pitcher sage, 179
Plant growth substance, 339
Plant proteins, 251
Plasma membrane, 359, 367
Plum, 231
Poa annua, 313
Polar transport, 207
Pollen transfer, 125
Pollen tube, 231
Polyols, 287

Porometer chamber, 323
Potamogeton lucens, 207
Potassium chloride, 309
Potato, droopy, 23
Probes, fluorescent, 241
Proline, 405, 413
Protein deposition, 37
Proteins nuclear, 53
Proteins, plant, 251
Protoplasts, 163, 417
Prunus domestica, 231
Psychrometer chamber, 323

Quantitative, water movement, 191
Quantum flux density, 9
Quantum yield, 9, 17
Quinate hydroxycinnamoyl transferase, 471

Radicle emergence, 293, 303
Reciprocity, phytochrome responses, 423
Red beet, 5
Red cabbage, 1, 245
Root branching, 313
Root growth, 293, 303
Roots, 485
Roots, primary, 343
Root temperature, 461
Rosaceae, 231, 461
Rumex crispus, 313

S-states, 117
Salt marsh plants, 287
Sedum, 223
Seeds, 367
Senecio brassica, 215
Senecio keniodendron, 215
Senescence, 27
Sensitivity, far-red, 1
Sensitivity, stomatal, 309
Scots pine, 75
Shade adaptation, 117
Sieve tubes, 173
Sinapis alba, 45, 495
Sodium fluxes, 5
Soil fertility, 313
Solanaceae, 471
Solanum tuberosum, 23, 471
Solutes, 417
Solutes, nitrogenous, 287
Sowing, date of, 477
Soybean, 155
Spectrometry, 339
Stain, histochemical, 251
Stomata, 309, 417, 455, 485
Stomatal conductance, 23, 65, 75
Stress, 367
Stress, saline, 287
Stress, water, 65, 147
Subcellular localization, 101
Substructure of PEP-c, 223
Sucrose, 405, 413
Sulphur dioxide, 75
Sunflower, 279, 423
Surface pH, 207
Synthesis, DNA, 53

Temperature, 231, 245
Temperature acclimation, 85
Temperature avoidance, low, 215
Temperature response, 477
Thylakoid reactions, 85
Tissue, 191
Tolerance, freezing, 215
Tolerance, frost, 241
Toxicity, 163
Tracer, vascular, 251
Transpiration, 179, 455
Transport, electron, 27
Transport, photosynthetic electron, 9, 17
Transport, polar, 207
Transport, water, 191
Tree sapwood, 271
Triticum aestivum, 27, 501
Triticum dicoccoides, 37
Turgor, 485
Turgor maintenance, 279
Turnip, 293, 303

Ultrastructure, 37, 367
Unstirred layer, 207
Uptake, 75
Uptake, ion, 443

Vascular tracer, 251
Vegetation, Afroalpine, 215
Vigna radiata, 423
Vigna sesquipedalis, 131
Vigna sinensis, 31
Vigna unguiculata, 367
Viscosity, 173

Water content, 271
Water potential, 271
Water relations, 147, 279
Water stress, 65, 147, 279
Water transport, 191
Water uptake, 323
Water-use efficiency, 179
Wheat, 27, 37, 501

Yield, quantum, 9, 17

Zea mays, 343